



TC-5389

**ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION**(Accredited by the National Accreditation Board for Testing and Calibration Laboratories, Govt. of India)  
ERDA Road, Makarpura Industrial Estate, Vadodara-390 010, India.

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RP-2425-007637

ULR No.- TC538924000014010F

**TEST REPORT**

SHEET 1 OF 5

**NAME AND ADDRESS OF CUSTOMER**

Dhan Laminates Private Limited  
25 New No.39A  
Chanditala Main Road  
Chanditala  
Kolkata-700053  
West Bengal

REPORT No.

RP-2425-007637

DATE OF ISSUE

11-06-2024

CUSTOMER REF. No.  
DATELetter & Form No.035  
11-04-2024DATE OF SAMPLE  
RECEIPT

DATE OF TESTING

09-04-2024

04-06-2024 to  
11-06-2024**SAMPLE DESCRIPTION**

(As Provided by customer)

Fiber Glass Epoxy Laminates  
Nema FR4 Glass Epoxy Laminated Sheet  
Grade: FR-4  
Nominal Thickness: 0.8mm  
Make: Dhan Laminates Pvt. Ltd.

**SAMPLE IDENTIFICATION**

ERDA Sample Code No.: ERDA-00576255

**TEST DETAILS****TEST SPECIFICATION**

As per SHEET 2 OF 5.

**REMARKS:** (1) Sample conforms to the requirements specified by the customer for test Sr. Nos. 1, 2, 3, 5, 6, 7, 8 and 9. (2) Sample conforms to the requirements as per test specification for test Sr. No. 10. (3) Grade is not provided as per standard for test Sr. No.4, hence remark for conformity is not given in the test report. (4) Photograph of sample is on SHEET 5 OF 5.

CHECKED BY

(SNEHA SHETH)  
APPROVED BY

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3 Publication of this report requires prior permission in writing from Director, ERDA.  
4 This report shall not be used for any purpose such as PR brochures, propaganda, advertisement and/or legal proceedings, unless for the granted purpose.  
5 Only the tests asked for by the customer have been carried out.  
6 Particulars of manufacturer/supplier, given in this report are based on information supplied by the customer, along with the test request/sample. ERDA does not assume any responsibility for the correctness of the information for above mentioned sample under test (SUT). ERDA will not be responsible for any changes in SUT made after the test. This test report is given as per instrument status while testing.  
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TC 3630558



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DATE OF ISSUE: 11-06-2024

SHEET 2 OF 5

**Sr. TEST DETAILS**  
**No.**

**TEST SPECIFICATION**

|                               |  |
|-------------------------------|--|
| 1. Specific Gravity           | IS 10192:1982 Incorporating Amendment No.1 |
| 2. Electrical strength        |  |
| 3. Insulation resistance      |  |
| 4. Comparative Tracking Index |  |
| 5. Tensile strength           | ASTM D638-14                               |
| 6. Flexural Strength          | ASTM D790-17                               |
| 7. Charpy impact strength     | ISO 179-1:2023                             |
| 8. Izod impact strength       | ASTM D256-23                               |
| 9. Thickness                  | IS 1998:1962 Incorporating Amendment No.1  |
| 10. Flammability              | UL 94:2013                                 |

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TC 3630559





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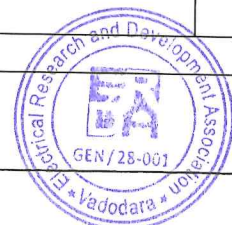


ULR No.- TC538924000014010F

Discipline: Electrical Testing

Group: Insulating Materials &amp; Insulators

| TEST REPORT No. RP-2425-007637   |   | DATE OF ISSUE: 11-06-2024   |   | SHEET 3 OF 5 |
|--|---|---|---|--------------|
| Sr. No.  | Particular of Tests & Cl. No.   | Requirements as per specification*  | Obtained value  | Remarks      |
| 1.   | Specific Gravity at 25°C,<br>Cl.No.4.4 Table-3, Sr. No. (i)   | 1.9-2.15  | 1.91  | Conforms     |
| 2.   | Electrical strength<br>Flatwise, kV<br>proof voltage test @14 kV/mm*<br>for 1 minute, in oil at 90°C<br>Cl.No.4.4 Table-3, Sr. No. (ix)(a)<br>Measured thickness: 1.98, 1.99 mm | 27.7 & 27.8<br>Sample shall withstand applied voltage without any electrical breakdown, for one minute. | Withstood the test voltage without any electrical breakdown for one minute. | Conforms     |
|  | Edgewise, kV<br>proof voltage test @60 kV* for 1 minute, in oil at 90°C<br>Cl.No.4.4 Table-3, Sr. No. (ix)(b)<br>Measured width: 25.45, 25.52 mm                                | 61.1 & 61.2<br>Sample shall withstand applied voltage without any electrical breakdown, for one minute. | Withstood the test voltage without any electrical breakdown for one minute. | Conforms     |
| 3.   | Insulation resistance, MΩ<br>(after 24 hours immersion in water, corrected to 20°C)<br>Cl.No.4.4 Table-3, Sr. No. (x)   | >500  | 1.4x10 <sup>9</sup>   | Conforms     |
| 4.   | Comparative tracking index, Volts<br>Cl.No.4.4 Table-3, Sr. No. (xiii)<br>Ave. measured thick.: 3.09mm  | --  | 'CTI >600'  | --           |
| 5.   | Tensile strength, Mpa<br>Cl.No.10   | >300  | 313   | Conforms     |
| 6.   | Flexural strength, MPa<br>Cl.No.10  | >350  | 421.7   | Conforms     |
| 7.   | Charpy impact strength, kJ/m <sup>2</sup><br>Edgewise, Notched<br>Cl.No.7   | ≥60   | 82.1  | Conforms     |
| 8.   | Izod impact strength, kJ/m <sup>2</sup><br>Notched<br>Cl.No.10  | ≥60   | 73.7  | Conforms     |
| * As specified by the customer.  |   |   |   |              |
| CHECKED BY  |   |   |   |              |



TC 3630560



TC-5389

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| TEST REPORT No.: RP-2425-007637   |  | DATE OF ISSUE: 11-06-2024         |                                   | SHEET 4 OF 5          |          |
|---|--|-----------------------------------|-----------------------------------|-----------------------|----------|
| Sr. No.   | Particular of Tests & Cl. No.  | Requirements as per Specification | Obtained value                    |                       | Remarks  |
| 9.  | Thickness, mm<br>Cl.No.4   | 0.8+0.0/-0.1*                     | 0.796                             |                       | Conforms |
| 10.   | Flammability<br>20 mm vertical burning test<br>Cl.No-8.0<br>Material classification (V-0)<br>Average of measured<br>Thickness: 0.797mm |                                   | <div>Set A</div> <div>Set B</div> |                       |          |
|   | 1) Afterflame time for each individual specimen $t_1$ or $t_2$ (Reported $t_1$ )   | $\leq 10$ s                       | 3<br>4<br>3<br>5<br>4             | 3<br>4<br>3<br>3<br>2 | Conforms |
|   | 2) Total afterflame time for any condition set ( $t_1$ plus $t_2$ ) for the 5 specimens  | $\leq 50$ s                       | 31                                | 27                    | Conforms |
|   | 3) Afterflame plus afterglow time for each individual specimen after the second flame application ( $t_2 + t_3$ )                      | $\leq 30$ s                       | 2<br>3<br>2<br>2<br>3             | 2<br>2<br>3<br>2<br>3 | Conforms |
|   | 4) After flame or afterglow of any specimen up to the holding clamp  | No                                | No                                | No                    | Conforms |
|   | 5) Cotton indicator ignited by flaming particles or drops  | No                                | No                                | No                    | Conforms |
| Notes: 1) Set A: Five specimens pre conditioned at $(23 \pm 2)^\circ\text{C}$ and $(50 \pm 5)\%$ RH for 48 hours<br>Set B: Five specimens pre conditioned at $(70 \pm 2)^\circ\text{C}$ for $(168 \pm 2)$ hours and then cooled to room temperature in the desiccators for 4 hours prior to testing.<br>2) The sample meets the requirement of UL-94 for classification as 'V-0'.<br>3) * As specified by the customer. |  |                                   |                                   |                       |          |
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TC 3630561



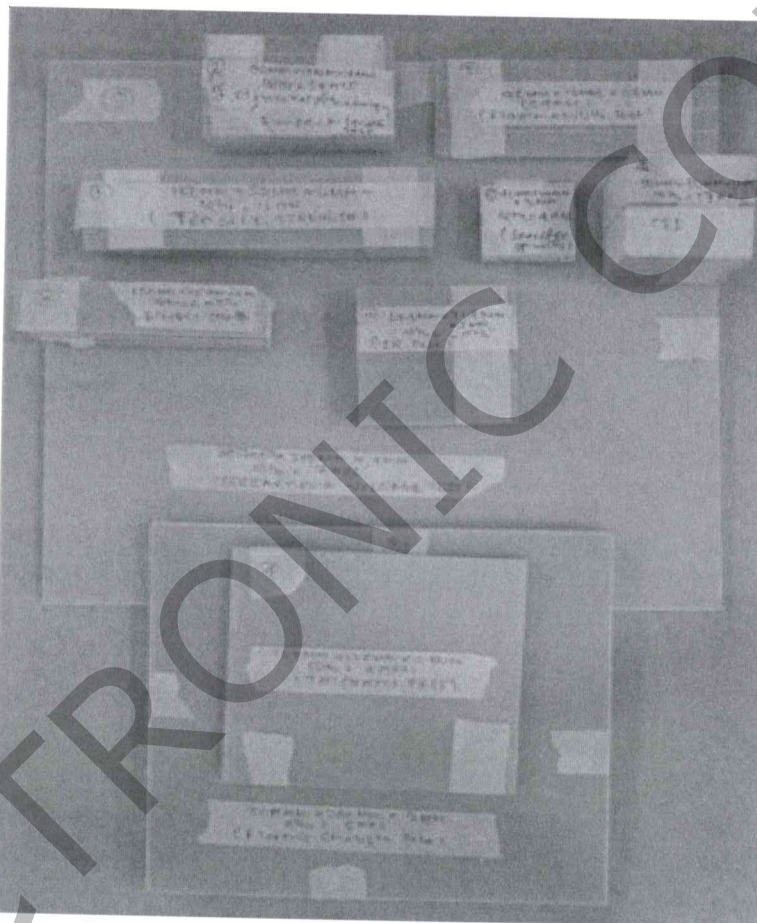


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TEST REPORT No. RP-2425-007637

DATE OF ISSUE: 11-06-2024

SHEET 5 OF 5



ERDA Sample Code No.: ERDA-00576255  
Photograph of sample in as received condition.

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\*\*\*\*\* End of Test Report \*\*\*\*\*



TC 3630562